IN THE SPECIFICATION

Before the "Background of the Invention" please insert:

Cross Reference

This is a continuation of U.S. patent application serial number 09/676,049 filed September 28, 2000.

The paragraph beginning on page 1, line 9 has been amended as follows:

The present invention ~~involves~~ relates to implantable medical devices that release a drug ~~from a polymer matrix~~.

The paragraph beginning on page 1, line 12 has been amended as follows:

Percutaneous transluminal coronary angioplasty (PTCA) is a procedure for treating heart disease. A catheter assembly having a balloon portion is introduced into the cardiovascular system of a patient via the brachial or femoral artery. The catheter assembly is advanced through the coronary vasculature until the balloon portion is positioned across the occlusive lesion. Once in position across the lesion, the balloon is inflated to a predetermined size to radially compress against the atherosclerotic plaque of the lesion ~~against the inner wall of the artery~~ to ~~dilate~~ remodel the arterial lumen. The balloon is then deflated to a smaller profile to allow the catheter to be withdrawn from the patient's vasculature.

The paragraph beginning on page 2, line 9 has been amended as follows:

A common technique for local delivery of drugs involves coating a stent or graft with a polymeric material which, in turn, is impregnated with a drug or a combination of drugs. Once the stent or graft is implanted within a cardiovascular system lumen, the drug(s) ~~are~~ is released from the polymer for the treatment of the local tissues. U.S. Patent No. 5,605,696 to Eury et al., U.S. Patent No. 5,464,650 to Berg, et al., and U.S. Patent No. 5,700,286 to Tartaglia, et al. provide examples illustrating the use of a polymeric coating for the local delivery of a drug or ~~substances~~ substance.

The paragraph beginning on page 2, line 16 has been amended as follows:

Stents are scaffoldings, usually cylindrical or tubular in shape, which are inserted into an anatomical passageway and operate to physically hold open and, if desired, to expand ~~or replace~~ the wall of a passageway. Stents are capable of being crimped onto balloon catheters for insertion through small cavities, positioned in a desired location, and then expanded to a larger diameter. Stents can be either balloon expandable or self-expanding.

The paragraph beginning on page 3, line 3 has been amended as follows:

Figure 1 shows an implantable medical device 10, which may be a stent or graft. Device 10 includes a substrate ~~11~~ 12 that may be formed of stainless steel, nickel titanium alloy, or another biocompatible metal. Substrate ~~11~~ 12 is covered (usually conformally) by a first layer 14. First layer 14 includes polymer containing a drug 16.

The paragraph beginning on page 5, line 8 has been amended as follows:

The barrier is necessarily biocompatible (i.e., its presence ~~doesn't~~ does not elicit an adverse response from the body), and typically has a thickness ranging from about 50 angstroms to about 20,000 angstroms. It is contemplated that the barrier contains mostly inorganic material. However, some organic compounds (e.g., polyacrylonitrile, polyvinylidene chloride, nylon 6-6, perfluoropolymers, polyethylene terephthalate, polyethylene 2,6-napthalene dicarboxylate, and polycarbonate) may be incorporated in the barrier. Suitable inorganic materials for use within the barrier include, but are not limited to, inorganic elements, such as pure metals including aluminum, chromium, gold, hafnium, iridium, niobium, palladium, platinum, tantalum, titanium, tungsten, zirconium, and alloys of these metals, and inorganic compounds, such as inorganic silicides, oxides, nitrides, and carbides. Generally, the solubility of the drug in the material of the barrier is significantly less than the solubility of the drug in the polymer carrier. Also, generally, the diffusivity of the drug in the material of the barrier is significantly lower than the diffusivity of the drug in the polymer carrier.

The paragraph beginning on page 7, line 14 has been amended as follows:

Figure 4 is a partial cross-sectional view of a barrier on the surface of a polymer-coated implantable medical device in accordance with a second embodiment of the present invention.

The paragraph beginning on page 7, line 19 has been amended as follows:

Figure 6 is a partial cross-sectional view of various types of barriers on or near the surface of an implantable medical device in accordance with a third embodiment of the present invention.

The paragraph beginning on page 11, line 15 has been amended as follows:

Examples of drug 16 include antineoplastic, antimitotic, antiinflammatory, antiplatelet, ~~antiallergic,~~ anticoagulant, antifibrin, antithrombin, antiproliferative, antibiotic, antioxidant, and antiallergic substances as well as combinations thereof. Examples of such antineoplastics and/or antimitotics include paclitaxel (e.g., TAXOL® by Bristol-Myers Squibb Co., Stamford, Connecticut), docetaxel (e.g., Taxotere® from Aventis S.A., Frankfurt, Germany), methotrexate, azathioprine, vincristine, vinblastine, fluorouracil, doxorubicin hydrochloride (e.g., Adriamycin® from Pharmacia & Upjohn, Peapack, New Jersey), and mitomycin (e.g., Mutamycin® from Bristol-Myers Squibb Co., Stamford, Connecticut). Examples of such antiinflammatory substances include estradiol. Examples of such antiplatelets, anticoagulants, antifibrin, and antithrombins include sodium heparin, low molecular weight heparins, heparinoids, hirudin, argatroban, forskolin, vapiprost, prostacyclin and prostacyclin ~~analogues~~ analogs, dextran, D-phe-pro-arg-chloromethylketone (synthetic antithrombin), dipyridamole, glycoprotein IIb/IIIa platelet membrane receptor antagonist antibody, recombinant hirudin, and thrombin inhibitors such as Angiomax™ (Biogen, Inc., Cambridge, Massachusetts). Examples of such antiallergic substances include permirolast potassium and tranilast. Examples of such cytostatic or antiproliferative agents include actinomycin D as well as derivatives and analogs thereof (manufactured by Sigma-Aldrich, Milwaukee, Wisconsin; or COSMEGEN® available from Merck & Co., Inc., Whitehouse Station, New Jersey), angiopeptin, mitomycin, angiotensin converting enzyme inhibitors such as captopril (e.g., Capoten® and Capozide® from Bristol-Myers Squibb Co., Stamford, Connecticut), cilazapril or lisinopril (e.g., Prinivil® and Prinzide® from Merck & Co., Inc., Whitehouse Station, New Jersey); calcium channel blockers (such as nifedipine), colchicine, fibrolast growth factor (FGF) antagonists, fish oil (omega 3-fatty acid), histamine antagonists, lovastatin (an inhibitor of HMB-CoA reductase, a cholesterol lowering drug, brand name Mevacor® from Merck & Co., Inc., Whitehouse Station, New Jersey), monoclonal antibodies (such as those specific for Platelet-Derived Growth Factor (PDGF) receptors), nitroprusside, phosphodiesterase inhibitors, prostaglandin inhibitors, suramin, serotonin blockers, steroids, thioprotease inhibitors, triazolopyrimidine (a PDGF antagonist), and nitric oxide.

The paragraph beginning on page 13, line 9 has been amended as follows:

Figure 4 illustrates another embodiment of the present invention, wherein barrier 28 is composed of a number of discrete deposits above first layer 24. When using certain deposition methods, the first few atoms or molecules of barrier 28 deposited on first layer 24 form small “nucleation sites~~,~~” 30 on the surface 29 of first layer 24. Barrier 28 may be made discontinuous by arresting the deposition process at the nucleation stage, as illustrated in Figure 4. However, if the deposition is allowed to continue, nucleation sites 30 expand in surface area and eventually coalesce into a continuous film, as barrier 28 is illustrated in Figure 3.

The paragraph beginning on page 18, line 8 has been amended as follows:

Similarly, the process parameters could be controlled so that nucleation sites 30 cover 75% of surface 29 of first layer 24 (which Figure 4 approximates). This would result in a drug delivery rate that is approximately 25% lower than that associated with the homogeneous film embodiment illustrated in Figure ~~2~~ 3.